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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/560,702	12/13/2005	Holger Hauptmann	58688US004	1948
32692 7590 07/22/2009 3M INNOVATIVE PROPERTIES COMPANY PO BOX 33427 ST. PAUL, MN 55133-3427				
EXAMINER MCDONOUGH, JAMES E				
ART UNIT 1793		PAPER NUMBER		
NOTIFICATION DATE 07/22/2009		DELIVERY MODE ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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# Office Action Summary

**Application No.**

10/560,702

**Applicant(s)**

HAUPTMANN ET AL.

**Examiner**

JAMES E. MCDONOUGH

**Art Unit**

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 June 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 15-20, 22-30, 33 and 34 is/are pending in the application.
- 4a) Of the above claim(s) 15-20, 22-26, 33 and 34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 27-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SI/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/4/09 has been entered.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 29 is rejected under 35 U.S.C. 102(b) as being anticipated by Garcia et al. (USP 6,464,765).

Garcia et al. teaches providing a ceramic frame work coating it with a solution comprising a saturated solution of soluble transition or rare earth metal salts which provide color, 2 to 7 parts by weight of polyethylene glycol, solvents such as water and alcohols, and firing the ceramic substrate to fix the metal on the ceramic (abstract, column 2, lines 13-64 column 3, line 16 to column 4, line 14), where the ceramic substrate is enriched with additives such as  $ZrO_2$  and  $Al_2O_3$  (column 3, lines 65-66), and

the composition after being added to the ceramic framework penetrates (adsorbs) up to about 2 mm into the surface (column 4, lines 20-25).

Although, Garcia et al. does not teach the use of 10,000-50,000 Mn polyethylene glycol, this is a product by process limitation and since the polyethylene glycol will be driven off during the firing process, the resultant product will be expected to be similar absent any evidence to the contrary.

Although, Garcia et al. does not teach the precise percent of metal in the solution, this is a product by process limitation and since the rest of the component will be driven off during the firing process, the resultant product will be expected to be similar absent any evidence to the contrary.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 27 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garcia et al. (USP 6,464,765) as applied to claim 29 above and further in view of Williams et al. (USP 6,786,994).

Although, Garcia et al. does not explicitly teach a metal salt, soluble in solvent in the range of 0.01-7% or polyethylene glycol having a Mn from 10,000-50,000, Garcia does teach the rest of the limitations of the claims. However, because Garcia et al. teaches that humectants can be used, which benefit the composition by preventing premature drying of the solution (column 3, lines 51-64) and Williams et al. teaches 1-20 wt% of a humectant that can be polyethylene glycol with a molecular weight from 100 to 40,000 (column 14, lines 52-62), it would have been obvious to someone of ordinary skill in the art at the time the invention was made to combine the teachings of Garcia et al. with that of Williams et al. with a reasonable expectation of success and the expected benefit that the solution will not prematurely dry before firing.

Although, the references are silent as to the weight percent of metal ions in the solution Garcia et al. teaches the use of saturated solutions, it is obvious to add as much metal ion as possible to increase the coloring properties of the solution (one of the problems with using solutions of metal salts is that the resulting coloration tends to be not intense Garcia et al. column 1, lines 20-23, this is why Garcia et al. use a slurry of saturated metal salts/complexes and suspended particles of metal salts/complexes), However, it is well known that many salts and complexes of transition metals and rare earth metals are only sparingly soluble and often max out in the millimolar concentration range, which would be less than 7 wt% of metal ion relative to the composition.

Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Garcia et al. (USP 6,464,765) in view of Williams et al. (USP 6,786,994) as applied to claims 27 and 29-30 above in further view of Schrewellus (USP 3,027,331).

Although, Garcia et al. and Williams et al. do not explicitly disclose the use of a presintered ceramic framework, Garcia et al. and Williams et al. teach the rest of the limitations of the claims. However, because Schrewellus teaches that sintering a ceramic increases its strength and allows it to retain its shape (column 15, lines 26-53), it would have been obvious to someone of ordinary skill in the art at the time the invention was made to combine the teachings of these references with a reasonable expectation of success and the expected benefit that the product formed will be stronger and more able to retain its shape during the coating and firing process.

#### **Response to Arguments filed 6/4/09**

Applicants argue against the 103 rejections.

Applicants argue that the instant invention uses a solution to treat the ceramic framework where the metal salt is soluble in the solvent, where the reference uses a slurry containing solid particles. This is not persuasive because applicant's claims do not disallow the presence of solid particles or a slurry, and applicants have failed to show that the metal is not soluble in the solvent at least to some extent.

Applicants argue that "if a (porous) ceramic framework is treated with a solution, the solution will migrate into and colour the entire framework, especially for small dental

pieces. This is in contrast to the slurry used by Garcia et al. The slurry (containing a huge amount of insoluble pigments) will not colour the entire framework." This is not persuasive for at least the following reasons: 1.) Applicants do not claim a "porous" ceramic framework, 2.) The instant claims do not disallow for the use of a slurry, and applicants have failed to show that the slurry of the reference would not penetrate a porous framework.

Applicants argue that the instant invention uses PEG with a molecular weight of 10,000-50,000, while the reference of Garcia teaches the use of PEG 200, while the reference of Williams uses 100-40,000 molecular weight. However applicants have here offered no reasoning that one skilled in the art could not use PEG with a higher molecular weight.

Applicants argue that in the instant invention a uniformly colored ceramic framework can be obtained showing less sintering deformation after firing. This is not persuasive because: 1.) Applicants do not claim this and 2.) Applicants have failed to show that the combination of references would not be capable of this result.

Applicants argue that when it comes to penetration into a ceramic material, each and every solution of PEG is not useful. This is not persuasive because applicants have failed to show that the reference(s) are not capable of penetration into a ceramic framework, and applicants fail to claim any amount of penetration into the framework or even what is the ceramic framework. Further it is noted that applicants do not claim any amount of deformation after firing or lack thereof, nor have applicants demonstrated that the references will possess a high amount of deformation after firing.

Applicants argue that the solution of Garcia even if modified by PEG of Williams is not suitable because it contains a huge amount of solid particles. This is not persuasive because the instant claims do not disallow the presence of solid particles, further the claims make no limitations that all of the metal present is in solution.

Applicants argue the declaration submitted by Holger Hauptman dated April 27, 2009.

Applicants argue that the PEG used will affect the solution produced. While this may be true applicants have failed to show any criticality for the claimed range of PEG, as only 35,000, 100,000, 300,000 and 1,000,000 molecular weight PEG has been used.

Applicants argue that this declaration shows that a solution comprising PEG having a Mn in the range of 10,000 to 50,000 in an amount of 2 to 8 % by weight has a viscosity below 30 mPas. Such a solution is useful to achieve the desired objective of "sufficient wetting of, and penetration into, the pores of the ceramic framework. This is not persuasive because applicants have failed to test Peg with an Mn of 10,000, 50,000 or any values less than 10,000. Further applicants are arguing features which are no claimed.

Applicants argue the declaration submitted by Holger Hauptman dated May 28, 2009.

This declaration is also not persuasive because there is not criticality shown for the claimed range of Mn for PEG. In fact the only PEG Mn's that were use are 400, 600,



1000, 3000, 6000 and 35000, while the claimed range is 10,000 to 50,000. It is also further noted that the data/evidence in the declaration can not be evaluated as all the examiner can see is white circles on a black background. It is noted further still that the solutions use an amount of PEG that is outside of the claimed amount (i.e. 0.5 % vs. the claimed 1-8 %), again failing to show any criticality for the instantly claimed invention.

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAMES E. MCDONOUGH whose telephone number is (571)272-6398. The examiner can normally be reached on 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on (571)272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JEM 7/17/2009

/Michael A Marcheschi/  
Primary Examiner, Art Unit 1793